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NATURAL GAS IN INDIANA.

AN EXPLOITED RESOURCE.

BY MARGARET WYNN.

[A paper prepared for a history seminar in Butler College, June, 1906.]

NATURAL gas was used in the United States as early as 1821. In that year the little town of Fredonia, in New York, used it for illuminating. In 1841 the gas was utilized at the salt wells of the Kenawha valley, West Virginia. The rudest system was put in and the gas was employed only in boiling brine. About two years later, in 1843, the people evidently awoke to the advantages of gas as a fuel, for they put down a one-thousand-foot well which produced high-pressure gas—the first of its kind on record.

At least two instances are known of gas being discovered comparatively early in Indiana. The first mention is that of a well at Francisville, in Pulaski county, put down during the oil excitement of 1865. The drillers failed to find oil and were bothered by a considerable flow of highly inflammable gas. As the uses of gas were not then known, the well was abandoned and continued to flow gas and water till 1888, when it was plugged. The Eaton well, bored in 1876, at a depth of six hundred feet yielded a flame two feet high. As the company was exploring for coal, and gas was not supposed to have any value, no attention was paid to it. Some years later, after the discovery at Findlay, Ohio, the people became interested, remembering the incident of the coal explorers. The well was drilled deeper and at nine hundred and twenty-two feet gas came. The discovery occasioned no little excitement. The well was fitted with four pipes, two on each end of a T. A flame about ten feet high arose from each. The light was seen from Muncie, twelve miles south. It was said that the heat could be felt sixty feet away. The odor of the gas was reported as not unpleasant. The same report concluded by announcing that "the work of laying mains and fitting houses will soon be commenced and this

enormous waste be utilized. One fact this well has settled, at least, namely, that the Ohio gas field reaches into Indiana." The last statement proved wrong, for there was a strip of counties along the eastern boundary of the State that proved barren.

Three great gas fields were developed in the United States before the close of the last century. The first, that of Pennsylvania, dates from the beginning of oil drilling in 1859. At first the gas from the oil wells was allowed to escape, since it was considered of no value. Later it was piped to a safe distance and burned. It was not till about 1880 that it was used extensively as a fuel. In 1883 it was piped to Pittsburg.

In 1884 gas was discovered at Findlay, Ohio. The pressure was very strong; the supply appeared inexhaustible. Manufacturers flocked to the field. The wildest excitement prevailed. Industries grew apace. Men grew wealthy. Cities grew from tiny villages. Then the gas began to fail. Owners of factories looked about for new sites.

Just at this time gas in Indiana became assured. In the report of the State Geologist for 1881, is recorded an account of a well in Fountain county which aroused the first serious interest in Indiana natural gas. "In May a boring was made for water. At something over a hundred feet a strong flow of inflammable gas took place, which continued up to the time of this report, November 10. The gas burned with a pale yellow flame and intense heat, and has no odor either in burning or before. It is evidently carbide of hydrogen or the fire damp of the miners. So far as we know it is a rare occurrence, and may be economized for lighting and heating purposes." By 1883 a number of wells had yielded a flow of gas which was utilized in a small way for concentrating brine and driving engines, as well as for illuminating purposes. The first high-pressure flow was discovered at Portland, in Jay county, March 14, 1886. In the following September the Kokomo Natural Gas and Oil Company began drilling. After thirty-one days of drilling, gas was struck one evening after eight o'clock. They continued drilling. The news spread rapidly. In the wildest excitement people rushed to see the wonder. By noon of the next day the pressure was strong enough to hurl bits of pebbles and rock high in the air. Then there was an explosion. The drill crashed to the bottom of the

well, crushing the thin shell floor. The puncture resulted in a rush of artesian water which did not affect the gas. At the time of the report, a month after the blowing of the well, the company was using the gas under its boilers, the city of Kokomo was laying mains and many residences were being fitted for gas. An item in the *Kokomo Dispatch* says: "Three stoves and a grate, furnished with gas, have been on exhibition in the store of the Armstrong-Landon Company the past week. The temperature is unvarying. A genial warmth pervades the remotest corners of the vast room, while the entire absence of smoke, dirt and ashes is favorably commented on. Four companies for laying mains are already organized and many are prospective." Late in the same fall, 1886, several strong wells were bored at Muncie. Immediately mains were laid and citizens were urged to use gas, since, the company said, "by a simple, cheap arrangement in the shape of a burner, any heating or cooking stove can be adapted to its use."

In less than two years the Indiana gas field was in its prime. Seventeen counties in the northeastern part of the State, comprising five thousand square miles, produced gas in commercial quantities. Speculation ran rife; real estate in the favored district jumped to unreasonable figures; new gas companies were organized every day; wells were put down by the dozen. Cities and towns were piped for the fuel. The failure of gas in Ohio caused the manufacturers to look for a new site. They began to flock to Indiana. They passed into towns whose streets were arched with hundreds of gas torches to welcome the new capitalists. Up till then this had been a region of farms and small towns; it now became the seat of prosperous cities. Wealth increased with astonishing rapidity. The gas belt was entering the era of its greatest prosperity.

The gas field of Indiana was much larger than that of any other gas-producing State. The field in Pennsylvania and Ohio comprised only a few hundred square miles. A further advantage that the Indiana field possessed was that it was practically continuous. Wherever the drill penetrated into Trenton rock within the limits a flow of gas in paying quantities was expected. The field was divided into three zones. The outer one, comparatively narrow, produced the weakest flow. The next

zone produced stronger. The center of the field, about Madison county, was surrounded by the strongest district. When gas began to fail, ten or twelve years after its discovery, the field narrowed down to some 2,500 square miles, centering around Madison county. Even this area was many times that of any other gas belt known. It was larger than the fields of Pennsylvania and Ohio put together.

In the early days of natural gas much time and money were spent boring wells in parts of the State which proved barren. Trenton limestone is a universal formation over the State. Gas is always found in Trenton limestone, but it was found that in the Trenton rock certain textural and structural conditions were necessary to the storage of gas in sufficiently large quantities to give a flow. I quote from the report of State Gas Inspector Leach: "Trenton limestone is seldom a gas rock below sixty feet from the upper surface, the gas-producing stratum ranging from five to twenty feet in thickness. Observations and analyses of this rock show that its productiveness is due to its porosity. Whenever the Trenton limestone is a gas or oil rock, it is highly crystalline and of a sufficient porosity to contain large quantities of these hydro-carbons. * * * Outside this area conditions are different. There the limestone is nearly pure and non-porous." Thus the presence of gas depends on a structural change in the rock. When, by a geological change, the stone has become magnesiated, the result is a porosity, offering storage for gas or oil. It is a question whether new fields may not be discovered in the future when this change takes place elsewhere. As a matter of fact, in most of the small gas fields in other States, notably Texas and California, the gas-producing stratum proves to be sandstone similar to that of Pennsylvania. Indiana and Ohio are the only gas-producing States where Trenton limestone is a universal formation. In either case the flow of gas varies according to the thickness of the gas-producing stratum. In Indiana the dolomitized Trenton limestone layer varies from five to twenty feet in thickness. The flow also depends on the degree of porosity.

Even if the necessary condition of porosity is fulfilled, if the stratum is much below sea level the gas is crowded out by salt water. This always proves true of strata more than one hun-

dred feet below sea level. Gas seeks the highest possible level, therefore the highest stratum contains most gas. In Indiana the highest point in the gas-bearing stratum is at Muncie, where it is sixty-five to seventy-five feet above tide, and the lowest at Kokomo, where it is eighty and ninety feet below.

The effect of natural gas on the economic development of the State was remarkable. In 1886, when gas was discovered, the gas belt was an agricultural district. Besides the customary flouring and sawmills, the factories were few and confined almost exclusively to the making of wooden wares. Indeed, the southern portion of the State had a greater proportion of factories than the northern. Soon, however, all classes of industries were represented. Most of the factories are well built, employing from three hundred to one thousand men. About the time the gas was beginning to fail in Ohio and Pennsylvania it was discovered in Indiana. The field was vast in extent, the supply strong. Capitalists were glad to move their interests to the new field. The loss of these factories to Ohio was great and in some cases a crisis resulted. By 1893 over \$300,000,000 had been invested in factories in Indiana, and more were constantly being erected. It was estimated that at that time not less than three hundred factories had been located and put in operation as a direct result of the development of natural gas. Many of them were very large, as the DePauw Plate-Glass Works at Alexandria, the largest of its kind in the world. In 1880 there were seven States manufacturing more glass than Indiana. In 1890 only three States stood above ours in this product. The value of glass products in 1880 was \$790,781. In 1892 it had risen to \$2,995,409.

The rapid increase of industry is shown by a few values taken from the reports of iron, steel and glass products: In 1880 the four glass factories of the State were valued at \$1,442,000, and employed 862 men. In 1890 there were twenty-one glass factories valued at \$3,556,563 and employing 3,089 men. The industry, in ten years, had nearly tripled in value, while the number of men employed was multiplied more than three and one-half. In the iron and steel industry there were in 1880 nine factories with a value of \$1,820,000, employing 1,740 men. In 1890 the number of factories had increased to thirteen, the value

to \$3,888,254. Two thousand six hundred and forty-four men received annual wages of \$1,215,702. From 1890 to 1895 the growth was still more rapid. January 1, 1895, the number of glass factories was fifty instead of twenty-one. They were valued at over \$5,000,000, and employed 7,000 men with an annual wage of \$3,000,000.

As late as 1895, in spite of the fact that the gas was beginning to diminish, companies constructed new pipe-lines and reinforced field pressure with compressing pumps. Factories continued to locate in the gas belt. Gas was especially valuable as a fuel in working upon glass, iron and steel, which require an even, intense heat. But though the fuel was the chief attraction which drew the factories to the State, there proved to be other advantages here. Proximity to the markets of the country and the splendid railroad facilities of the section make it one of the finest manufacturing centers of the country. The fact that the Indiana coal field is conveniently close to the gas belt, and the number of railroads connecting the two made it very easy to change from gas to coal. As early as 1894 several of the big factories used coal in times of low pressure. No new gas fields of importance opened up during the decline of the Indiana fields. Many of the manufacturers who had come on account of the gas preferred to use other fuel where they were rather than seek a new location. As a matter of fact, very few factories left the State when gas failed, and those which did were the smaller and less valuable plants. Practically no factories now depend on gas for a fuel. Therefore one may say that the great value brought to the State by gas remains after the gas itself is, commercially, a thing of the past.*

How much the development of natural gas added to the permanent wealth of the State is difficult to ascertain. In 1896, ten years after the discovery of gas, the wells, pipe-lines, pumping stations, etc., of natural gas companies were assessed for taxation at nearly \$5,500,000. The factory property alone brought in by gas was worth \$6,000,000. Since Madison county was the

*The fact that more factories did not leave Indiana when the gas which had attracted them here gave out, was also probably due in part to the general prosperity and heavy demand for their products during the years that the gas was giving out. This both made it possible for them to continue on the basis of a new and more expensive fuel, and at the same time added to the loss involved by moving.—*Editor*.

center of the gas area, a few statistics from its records will show the general increase of wealth. In 1887 the total assessed valuation of Madison county was \$9,837,595, with a tax levy of \$168,339. In 1895 the total value had increased to \$26,994,775, with a tax of \$397,569. This shows a total increase of wealth in eight years of \$17,157,180, or, exclusive of gas property or factories, \$13,917,180. The total value of taxable property in Delaware county in 1886 was \$9,590,185. In 1899 it was \$21,632,900. Taxes were levied in Grant county in 1886 on a valuation of \$8,921,445. In 1899 this had risen to \$23,000,000.

As an estimate of the cash value of natural gas itself, as a fuel, in the whole United States during the seven years when the Indiana field was at its best, I give the following table taken from "Mineral Resources of the United States," a volume published by the government in 1893. The basis of valuation is the amount of fuel displaced. Since the table begins with the years when gas in Ohio and Pennsylvania was on the decline, and gas in Indiana was being developed, the increase shown is almost wholly to be attributed to Indiana:

1886	1887	1888	1889
\$300,000	\$600,000	\$1,320,000	\$2,075,702
1890	1891	1892	1893
\$2,302,500	\$3,942,500	\$4,716,000	\$5,718,000

This shows an increase in value of \$5,418,000 in seven years.

Very early in the history of the field pipe-lines were laid to conduct gas to cities outside of the gas district. Early in 1888 a notice in the *Indianapolis Sun* announced that the Indianapolis Gas Company was ready to supply citizens with natural gas, mains having been laid in Washington street, Alabama street, Capitol avenue and Maryland street. Although a slight flow of gas was struck at Broad Ripple, the extreme edge of the gas field passes through the northeast corner of Marion county, consequently the city received her gas supply from the Muncie field. Perhaps the most important development in this direction was the establishment of pipe-lines from the Indiana gas fields to Chicago. In the last days of natural gas this absorbed a large part of the product of whole districts and give rise to interest-

ing legal questions, decided for the most part in favor of the companies controlling the lines.

The most salient feature of the history of natural gas in Indiana, however, is not the wealth that was obtained through its utilization, but the enormous waste which attended its discovery and its use. Exploitation of natural resources, such as this, means the impoverishment of these resources. If in the process they are fully utilized, so that an equivalent in wealth and comfort is returned to the people in possession, there can be no cause for regret. But in this instance such was not the case. An appallingly large amount of the gas taken out of the earth was utterly wasted, so that the State of Indiana to-day has not secured a gain at all commensurate with the value of the natural resource which has been destroyed forever.

When gas was discovered only a certain amount existed in the reservoirs of gas- and oil-bearing rocks. The generation of these products, at least in paying quantities, had been the work of ages. Even the most careful use of gas for the purposes to which it was applied would probably have exhausted the supply within an ordinary lifetime. But the end was hastened by the reckless extravagance and waste. In the first few years of gas development it was shown that over 100,000,000 cubic feet of the valuable fuel was wasted daily. Even at the low prices that obtained at this time this waste would amount to millions upon millions of dollars annually. All of this waste was the more reprehensible in that when gas was discovered in Indiana there had already been two great gas belts which had been developed and had failed. In view of this fact, the fatuity of those who thought that the gas supply was illimitable, and of those who wasted it or thought it of no value, is hard to understand.

The chief items of waste were carelessness or incompetency at the wells, wasteful methods of burning gas in the open, extravagant use of gas for domestic purposes due to the general prevalence of the contract instead of the meter system, and the failure of the State government to prevent abuses in the gas business. In the beginning, much of the waste was due to ignorance of methods of handling gas. When a well was blown the men were slow to cap it and many thousands of dollars' worth escaped

before the flow was confined. Moreover, wells were occasionally allowed to flow continuously as an advertisement. For the first three or four years an average day's flow from a strong well was worth nearly \$600. As early as 1888 it developed that the pressure was slowly diminishing. However, it was not at a rapid enough rate to produce immediate alarm. Extravagance and waste continued. In 1889 the average daily waste from uncapped wells alone was estimated to be 10,000,000 cubic feet.

Later, when oil wells were drilled near the gas field they often showed strong gas pressure as well as oil. If the gas could not be disposed of to some company it was deemed necessary either to allow it to escape or to close the well to protect the gas industry. The latter alternative was seldom taken except under compulsion. The first successful attempt to develop an oil field was near Alexandria, in Madison county, the very heart of the gas field. Oil operators flocked to see the "gushers." Excitement ran high. Companies were quickly organized. From April 23, 1897, to March, 1898, seventy-five wells were drilled for oil. Of these forty produced both gas and oil, thirty-three gas only, and only three were dry. The waste of gas was enormous. To prevent damage to property the gas was burned for eleven months. They were not prepared to handle gas and enough escaped before they were tubed to supply a large town. The oil field was only a few miles from Alexandria, and the citizens became alarmed at the gas waste. However, all measures to protect the gas industry at the expense of the oil industry were opposed. In 1898 the Supreme Court decided that the anti-waste law was constitutional and that an individual could stop the waste of gas by injunction. This, in some instances, closed the oil wells and stopped the waste of gas.

The flambeaux were another occasion of great waste. These open pipes with their great flame of gas shooting out and burning a hundred times as much gas as was necessary to secure the light wanted, were left going continually, not only in towns but in the country, and around gas wells and plants. They consumed, on an average, probably from 150 to 200 cubic feet of gas per hour. No one ever thought of turning them off when not needed. The waste can not be calculated. Farmers objected seriously to giving up the open torch. If they owned their well

they considered the gas their property, or they claimed the privilege of using the gas as they pleased under the terms of their lease.

Much gas was wasted in domestic consumption through ignorance. Gas, for perfect combustion, requires a mixture of air. Persons, especially in the country, were often found using from three to five pounds pressure, whereas a proper mixer required, at the utmost, five to ten ounces. This resulted in much waste. The gas passed through grates and stoves only partially consumed. From tables given by the State Geologist of Ohio, it was found that the greater the pressure in any sized mixer the greater number of cubic feet of gas is consumed with the same amount of air. It follows that the higher the pressure the greater the amount of gas passing through the mixer and the more imperfect the combustion. This was not only a waste, but the great quantity of gas allowed to escape unburned, in several instances resulted in suffocation and explosions.

All over the country the contract system of selling gas prevailed. By this system gas was sold, per stove or grate, from 75 cents to \$1.50 per month, according to size. Bills were paid quarterly or by the month. By this system one man could burn his stove day and night full blast for a month and only pay as much as his neighbor who had been away, leaving the gas turned off. The injustice of the system is apparent. Not until gas began to fail was the meter system introduced. This plan had been advocated by some for a long time, but the people were slow to adopt it, feeling that there was plenty of gas, or that the gas companies would put the meter rate so high that there would be no economy in it for the consumer. The idea of care in preventing waste never presented itself to the mass of consumers till the apparent failure made them apprehensive lest the supply should not last. A company's gas inspector often found gas burning full pressure and the windows up to let out the heat. People turned the gas up to a certain height and left it so indefinitely. It was possible to leave one's home for week at a time, keeping it at practically the same temperature as when occupied.* The cheapness of the fuel caused people to disregard

*Carelessness engendered by this practice, together with a greatly varying and uncertain pressure resulted, in the later days of the use of gas, in great losses by fire. After 1900 scores of houses were burned every year by a strong pressure coming on and overheating a stove or furnace at night or in the absence of the owner.—*Editor*.

its value. Often most of the heat went up the chimney through an open damper.

When the gas began to fail meters were put in at some points, but they were not so generally adopted as materially to check the waste. Many factories, owning their own wells, had used meters some time before the public consented to use them. Factory owners most interested in the supply were most anxious to adopt means to preserve it. But they were not able to effect much.

The laws of the State sought to regulate the use and prevent the waste of natural gas, and to protect from danger those who used it by making it the duty of the State Gas Supervisor to inspect pipe-lines, regulators, mixers, etc., from time to time. He also was to see that proper precautions were taken to insure the safety of those who used it or who operated wells. Many pipe-lines were condemned and caused to be relaid.

Perhaps the most interesting law passed by the General Assembly was the Flambeau Act of February 25, 1891. This law prohibited the burning of flambeaux or open torches, but allowed gas to be used in jumbo burners (enclosed in glass) which were to be turned off not later than 8 a. m. and lighted not earlier than 5 p. m. Violators were to be fined \$25 for first offense and not more than \$200 for second offense. This law was called forth by the profligate waste of gas in open torches. Many of the towns were lighted in this way. In several cities, by 1891, city electric lighting plants had been put in, but the gas torches burnt on in the glare of arc lights. On farms, also, gas torches often burned day and night in the farmer's yard or garden. Many of the farmers owned their wells and they resented the laws as curtailing their rights as citizens. They contended that natural gas was property and that they had a right to use it according to their discretion. On the other hand, the State claimed that the welfare and prosperity of the public overshadowed the desires or the good of the individual. Public good demanded that reasonable use only be made of gas. Since economy was necessary, the enforcing of the law to bring this about was only the legitimate exercise of the powers of the State. The question of the constitutionality of the law came up. For four years it was seldom enforced. Then in October, 1895, a

suit came up in Blackford county which decided the case. The State Supervisor of Gas brought suit to enforce the law. It was carried to the Supreme Court which upheld the constitutionality of the law, and after that there was little trouble in enforcing it.

A law passed in March, 1891, made it unlawful for any person, in any manner whatever, to change, alter or extend any service-pipe or attachment of any kind, or connection through which natural or artificial gas was furnished from the mains, without permission from the owner. It was unlawful, also, to enlarge the orifice of mixers or to use gas for heating without mixers; for any person, unless employed by the company concerned, to set on fire any gas escaping from wells, broken or leaking mains, or to interfere in any way with appliances.

This law was necessary for two reasons. The wanton tapping of the Broad Ripple mains, apparently with malicious intent, is an instance of one thing that had to be provided against. It was a very cold period, and before the break could be repaired much suffering from cold was reported. The offenders, in this case, were not found. Again, that part of this act referring to lighting gas escaping from a leak, or broken pipe, was necessary for the safety of the public. Many of the mains in the early history of gas had been carelessly laid by inexperienced workmen. A citizen smelled escaping gas. He took his match and went to hunt for the leak. It was possible that a dangerous and costly explosion would follow. The clause forbidding the enlargement of the orifices of mixers was gravely disregarded as early as 1895. By 1900 it would have been practically impossible to find an unbored mixer in Indianapolis and other cities.

The legislature sometimes showed great lack of insight into gas conditions, and passed very faulty laws. Probably the best example of this is the Act of March 4, 1893, regarding the plugging of abandoned wells. This law provided for plugging as follows: "If well has been shot there shall be placed in the bottom of the well a plug of pine wood of a diameter within one-half inch of that of the well; to extend at least three feet above the salt water level. The plug shall be rammed down. After ramming, the hole shall be filled with broken stone or sand and rammed to a point four feet above Trenton rock. On

top of this shall be placed another plug at least five feet long, which shall also be rammed down. If not shot the well shall be filled with sand, stone or dry cement to a point four feet above the gas-bearing rock. Above this shall be placed a six-foot plug which shall be rammed. The casing of the well shall be removed and a cast-iron ball eight inches in diameter cast in the hole and rammed by the driller, after which not less than ten foot of sand shall be placed on top." Penalty for violation was \$200, and \$200 for each day of continued violation for ten days. This would seem at first sight an ample enactment, providing in detail an exact method of doing the work which, if followed, would hermetically seal any outlet. Unfortunately, however, it was weak at one point—it did not provide for any witness when the work was being done. When it had been done the expense of ascertaining whether the law had been complied with was prohibitive. As a consequence, in the years between 1895 and 1900, when many wells were abandoned, comparatively few were plugged according to the law.

Another act of the General Assembly which caused much trouble was that which prohibited the transportation of gas through pipes at more than 300 pounds pressure per square inch; and the use of any device for pumping or any artificial means that should have the effect of increasing the natural flow of the gas from any well or of increasing or maintaining the flow of gas through pipes used for conveying it. At this time a large quantity of gas was piped to Chicago. (This, by the way, was in violation of a law forbidding the piping of gas to any point without the State. The Supreme Court twice declared this law unconstitutional and it was not enforced.) A test case was made of the Jamison suit against the Indiana Natural Gas Company. A series of tests was made by the State Gas Supervisor who found the pressure in the Chicago line in no instance to be more than 295 pounds. The Supreme Court held that pressure might be applied, provided it did not exceed 300 pounds per square inch. This decision, though perhaps hastening the failure of gas, lengthened the period of its practical application in industry and domestic consumption several years, for when gas began to fail more rapidly compressing stations were put in to assist the flow.

About 1890 the supply of gas began to go down rapidly. In the hard winter of 1892-'93 the supply fell so far short that much suffering resulted. Manufactories were compelled to shut down on account of deficient gas supply. By 1893 wells were being abandoned every month. In order still to supply their patrons, the gas companies (Chicago monopolized as much territory as possible) drilled wells more and more remote, so that the field was soon developed to the uttermost. By 1893 the field pressure had been reduced from 320 to 240 pounds, and pumping stations were being placed at intervals to reinforce pipe-line pressure. In 1894 State Gas Supervisor Jordon strongly recommended that the use of meters be enforced by law. He said the domestic consumption was 50 per cent. greater than necessary. This would be remedied by meter. In the same report he advised the use of some coarser fuel in tile or rolling mills and in the melting furnaces of glass factories.

Salt water, which is universally present under all gas and oil territory, was the most difficult and dangerous element with which the natural gas industry had to deal. As the gas diminished the salt water horizon rose toward the highest point in the reservoir till it displaced the gas; or, if the draught was great, it rose higher and higher until it sealed what gas was left securely in the rocks. The advance of salt water over the field marked the coming of the end of the gas wells. It appeared first in the early history of the field on the west side and sometimes overcame wells of 260 pounds pressure. It advanced slowly but surely, till by 1898-'99 few wells were free from water. In November, 1897, only 50 per cent. of the wells in the Madison county district showed water. In November, 1898, only four out of thirty-six did not show the presence of water. This illustrates the rapid rise of the salt water level when the gas had once begun to fail. Some wells were drowned out and abandoned at 250 pounds pressure. The seriousness of this foe is realized when one finds that at that period a well paid at 90 pounds, yet many had to be abandoned at 175 pounds. Some wells were redeemed by the inserting of pipes of a size small enough to enable the gas to raise the water. The gas and water were then separated automatically. The pressure sank rapidly from the first. The initial rock pressure was 325 pounds. Jan-

uary, 1888, it was reduced to 230; January, 1901, to 115; 1902, to about 80.

The use of gas had to be gradually abandoned from 1900 on. In the winter of 1905-'06 the supply fell far short at Muncie, which is nearly in the heart of the district. Three years ago the pipe-lines refused to supply gas longer. The "gas field" or "belt" is now history. Natural gas, though still used in places, as a commercial factor is a thing of the past.

INDIAN LANGUAGES.

THE resolution passed at the last meeting of the Indiana Historical Society, given below, should receive the support of all who are interested in the history of the former Northwestern Territory. Mr. Jacob P. Dunn has collected much information about the meaning of Indian names and has urged for some time that concerted action be taken for the preservation of the knowledge still remaining in this interesting field. It is to be hoped that through the national Bureau of Ethnology a larger work than it is possible for individuals to do may be brought about.

The resolution referred to is as follows:

WHEREAS, The Indian tribes that formerly inhabited the Ohio Valley have been widely scattered, and there is danger that their languages may be lost through the younger generation's adopting the English language, and,

WHEREAS, There is no adequate source of information now available in print even as to the meaning of the names of lakes and streams left to us by the Miamis, Pottawattamies, Shawnees and other tribes,

Resolved, That the national Bureau of Ethnology be requested to collect and publish such information as to these languages as can now be obtained, and especially that of the great Miami nation, including the Weas, Piankeshaws, Peorias, Kaskaskias and other tribes who occupied the greater part of Indiana and Illinois;

Resolved, That our Senators and Representatives in Congress be requested to use their influence to secure this result, and to